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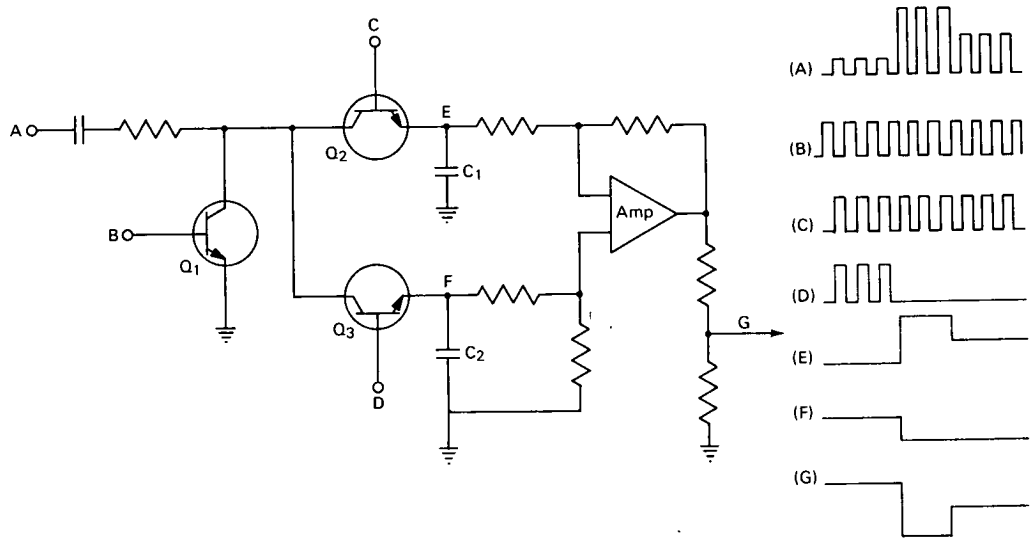
NASA TECH BRIEF

Detector Circuit Compensates for Vidicon Beam Current Variations



The problem: Temperature excursions in vidicons (television camera tubes) result in dark current variations that cause black level shifts. These shifts must be compensated for if the video output is to be a true representation of what the vidicon "sees".

The solution: Design of the detector circuit so that it clamps the video signal to the dark current component of the signal. This is accomplished in the detector circuit since the information pulses must first be detected to obtain the video envelope for transmission.

How it's done: The video pulse signals (A) from the video amplifier are supplied to the detector circuit input. Video clamping pulses (B) gate Q_1 on when video information is present, establishing a zero reference level for the incoming video and eliminating background noise between pulses. Video gate pulses (C) gate Q_2 on when video is present, and dark current gate pulses (D) gate Q_3 on when the dark current component is present. The video signal is detected by the charge and discharge of C_1, and the dark current component is detected by the charge and discharge of C_2. The video envelope (E) is applied to the inverting input of the differential amplifier and the dark signal envelope (F) is applied to the noninverting input. The common-mode rejection characteristics of the differential amplifier cancel the dark current component, thus clamping the video signal at the level of the dark current component (G). Because black level shifts occur as a function of variations in the dark current component level, dark current cancellation will compensate for these shifts.

Notes:

1. This innovation could be used in other repetitive pulse systems to compensate for background noise variations or transducer bias fluctuations.

(continued overleaf)

2. This technique for black level compensation is applicable to most video systems.
3. Inquiries concerning this innovation may be directed to:

   Technology Utilization Officer
   Goddard Space Flight Center
   Greenbelt, Maryland, 20771
   Reference: B65-10212

Patent status: NASA encourages commercial use of this innovation. No patent action is contemplated.

Source: Radio Corporation of America
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Goddard Space Flight Center
(GSFC-310)